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FOUNDED BY WILLIAM HUNTING, F.R.C.V.S.

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AN UNTRIED TREATMENT OF PLEURISY.

This week we publish an abridged Italian report upon autoserotherapy and serotherapy in equine pleurisy and pleuro-pneumonia, which is of interest on account of the present paucity of records on the subject. These treatments are now fairly well known in human medicine; but they appear to have been very little practised by veterinary surgeons. The whole sum of the existing records of their use in veterinary practice is quite insufficient to justify a conclusion as to their value. The present report is highly encouraging so far as it goes; but that is all that can fairly be said of it. Possibly it may induce some of our members, especially those in the army, to give the treatments a trial.

Many men in the army must now be seeing more cases of pleuric exudation than usually fall to the lot of the private practitioner; and this is a good opportunity of improving our knowledge of their treatment. One point in particular arises which the experience of the war ought to definitely settle—the desirability of puncturing the chest very early. Before the war, some clinicians of high repute had begun to advocate puncturing the chest much more often, and at a much earlier stage of the illness, than had ever been customary before. According to this school, puncture should not be delayed until the presence of fluid in the chest is certain or nearly so, but should be adopted as a routine measure whenever the presence of fluid appears even possible. Practically this means a routine exploratory puncture, which is certain to very often yield negative results. There is a great deal to be said in support of it; and nothing could be said against it from a professional point of view, for veterinary surgeons know that a properly performed exploratory puncture is quite innocuous. But clients often do not know this, nor do they understand the impossibility of diagnosing pleural effusion very early; and it is certain that some veterinary surgeons have hesitated to adopt this method in practice on account of the probable effect of frequent fruitless punctures upon clients. Fear of the client has held veterinary practice back in many directions, and this is one of them. In the army, a veterinary surgeon has a much more free hand in treating individual cases than he often has in private practice; and it may be noted that this method of early routine puncture at least very largely originated in the Army. There, also, it ought to be fairly tested; and, if it is justified during the war, it will be easy afterwards to establish it in civil practice.

NOTE ON THE SUBCUTANEOUS USE OF ARECOLINE.

Arecoline is not a suitable drug for impaction of bowels. A purgative and sedative should be first given, followed on with Arecoline in due course.

We have used it in ordinary cases of colic, with quite good results. The first injection should always be given combined with Strychnine (Arecoline ½ gr., Sulphate of Strychnine ½ gr.). I have frequently observed marked salivation and peristaltic action within seven to ten minutes. If not much result within half an hour, we give a second dose—one grain Arecoline alone. If that fails we would try Eserine; but in ordinary cases the second dose (1 gr.) usually causes purgation.

The experience out here is that Arecoline, even given in ½ gr. doses, will often produce accelerated breathing to a marked extent unless used with Strychnine sulphate. I would strongly advise the use of the combined drugs. I may say hypodermics are extensively used out here, and, I consider, a very convenient way of treating the cases; particularly when you have a number to handle. We always had Parke, Davis & Co.'s tablets, from Detroit.

Halifax, Nova Scotia. J. B.

MILK FEVER (?) FOUR MONTHS AFTER CALVING.

A case of this nature occurred in my practice last week, and I record it because, although I think it is not unique, I believe it to be very unusual; and to show that similar cases, although occurring some considerable time after parturition, should be treated precisely the same as though the animal had only recently calved.

It was on the night of the 5th inst. I was called to this case. At that time the patient was down and unable to rise, showing signs of cerebral trouble, such as champing of the mouth and a flow of frothy saliva. On being informed that the cow had calved on 9th January last, I, at the time, did not diagnose milk fever, but thought I had some form of hysteria to deal with. Consequently I gave a dose of Magnes. sulph. and Chloral hydrate, the patient swallowing this with difficulty.

I saw her the following morning about 10 o'clock and found her much worse. She was quite helpless, and unconscious, with the peculiar moan, dropping lower jaw and eyes gazing at nothing, with which one is so well acquainted; in fact, a typical case of milk fever.

I at once put her through the regulation injection and inflation of the udder treatment, and with the exception of having her propped up on the sternum and the application of cold swabs to the head, did nothing else. She soon began to rally, and I was informed on my visit the next day that she was up in four hours, and she had gone on well since.

Perhaps a more up-to-date scientist than I am can explain why toxic changes can take place in the udder so long after parting with the young.

R. W. KNOWLES, M.R.C.V.S.

Wisbech, May 8.

[In some similar cases there has been evidence of the animal having fed freely on rich green food, such as clover, but in this case it was stated that the cow had been on ordinary grass pasture.]

ABSTRACTS FROM FOREIGN JOURNALS.

AUTO-SEROTHERAPY AND SEROTHERAPY WITH PLEURIC EXUDATE IN EQUINE PLEURISY AND PLEURO-PNEUMONIA.

Domenico Germani, a captain in the Italian Army Veterinary Service, having tested these treatments with good results, has just published his experience of them. Auto-serotherapy in pleurisy is associated with the name of Gilbert, who first applied it to this disease in man. It consists in subcutaneously injecting a small quantity of the pleuric exudate. It has been much practised in human medicine; but in veterinary literature the records of its use are few, and opinions differ as to its value. Magnin, in 1909, practised it in one case of pleurisy associated with strangles without success. Darrow, in four cases, obtained two recoveries, one doubtful result and one failure. Haan, in 1913, obtained "miraculous successes" in some desperate cases.

The author's cases were of pleurisy which accompanied or followed unilateral or bilateral pneumonia, probably of high infectivity. In three cases alone, in which it was possible to examine the pleuric exudate, typical streptococci were encountered along with other microbes, and predominating over them. Lack of facilities prevented the author from carrying the bacteriological investigation further than this. He reports the clinical histories of ten cases, seven of which are summarised below.

Case I. A mare, four-and-a-half years old, of Sardinian breed, admitted to the infirmary on February 1, with uncertain gait, loss of appetite, dulness, prostration, keen thirst, temperature of 104° F., small pulse, superficial abdominal respiration, and pain upon digital pressure of the ribs. Pleurisy was diagnosed; and treatment was directed to the prevention of effusion. On February 5 effusion was commencing, and the temperature was 102·2. On February 8th the temperature was the same; thoracentesis was performed, 500 c.c. of exudate was withdrawn, and 150 c.c. of this was injected subcutaneously.

On February 9 the temperature was 103·1° F.; the thoracentesis was repeated, and 100 c.c. of exudate was injected subcutaneously. On February 10 the temperature was still 103·1° F.; but the horse was easier, and the effusion was inclining to absorption. On February 11 the temperature was 101·2°; diuresis was increased, and the urine was normal in colour. Recovery followed.

Case II. A five-year-old horse of Sicilian breed entered the infirmary on February 28 with febrile symptoms. On the 29th, he showed all the clinical appearances of bilateral pneumonia. On March 7 there was bilateral pleuric effusion; and the temperature was 102·2° F. An exploratory puncture gave positive results, but the horse's condition was so bad that only a minimal quantity of exudate was withdrawn for fear of inducing a mortal syncopy. On March 9 the temperature was 101·2° F.; the horse was extremely prostrated, with the eyes glassy and fixed, and groaned at the least displacement. Death appeared imminent. Serotherapy was resorted to, use being made of pleuric exudate drawn from *another* horse with an identical disease. A dose of 100 c.c. was injected. On March 10 the temperature was 102·9° F., and a second injection of the same exudate in the same quantity was given. A third injection of the same dose was given on March 11. The improvement was surprising; resolution commenced, and the horse became convalescent on March 18.

Case III. was a filly, two-and-a-half years old, of Sardinian breed, put under treatment on February 28 for unilateral pneumonia. On March 6 the condition suddenly became worse; the temperature rose to 105·8° F., and there was bilateral pleuric effusion in the inferior zone of the chest. On March 7 one litre of pleuric exudate was withdrawn, and 100 c.c. of it was injected subcutaneously. In the evening the temperature had not undergone sensible oscillations. On March 9 a second injection was given; the temperature remained constantly at from 100·4° F. to 100·9° F. On March 11 the exudate had assumed a greenish tint and a fluid character, and was now almost completely absorbed. The animal gave no further cause for uneasiness, and recovered.

Case IV. A five-year-old horse of Sicilian breed, much reduced in condition owing to having previously undergone castration, came under treatment on February 28 with symptoms of acute muscular rheumatism. On March 3 he showed unilateral pneumonia, and on March 8 bilateral pleuric effusion. On March 9 the first and only thoracentesis was performed; one litre of exudate was withdrawn, and 100 c.c. of this was injected for seven consecutive days. The temperature remained persistently elevated at from 102·2° F. to 103·1° F. The horse, which, of all those treated, was the one that showed the greatest depression, commenced to improve on March 23 and recovered.

Case V. A five-year-old horse of Sardinian breed came under treatment on March 12 with bilateral pneumonia. Ordinary treatment was

adopted. On March 18 the horse was in so grave a condition that treatment appeared useless; each respiration caused a violent agitation of the whole body, accompanied by a groan which could be heard outside the stable. Serotherapy was tried as an experiment, the pleuric exudate *from Case IV.* being injected subcutaneously in a dose of 90 c.c. Rapid and surprising improvement followed, and recovery was complete on April 2.

Case VI. An eight-year-old horse of Sardinian breed came under treatment on March 18 with a high temperature and profound alterations of the respiratory rhythm. Unilateral pneumonia was diagnosed. On March 20 an exploratory puncture gave positive results; and 100 c.c. of the pleuric exudate *from Case IV.* was injected subcutaneously. The temperature was persistently elevated. On March 21 a second injection was given; and in the evening the temperature was reduced to 101·6° F. On March 23 the temperature was almost normal, and recovery followed.

Case VII. A three-year-old colt of Sardinian breed came under treatment on March 13. Pneumonia and exudative pleurisy were diagnosed and auto-serotherapy was adopted, 150 c.c. of exudate being injected for two consecutive days. The temperature did not undergo notable oscillations under the influence of the treatment. On March 22 an exploratory puncture revealed a considerable descent of the level of the exudate, which had assumed a fluid and greenish aspect. Recovery followed.

From these observations the author concludes that both auto-serotherapy and serotherapy, in horses affected with infectious pleuro-pneumonia with pleuric exudate, are alike innocuous and advantageous. The pleuric exudate, besides stimulating the formation of antibodies in the organism of the subject from which it comes, exercises identical functions in other subjects of the same species affected with an analogous disease.
(*La Clinica Veterinaria*).

[In the author's other three cases neither auto-serotherapy nor serotherapy was adopted.—*Transl.*]

Œsophageal Diverticulum in a Pig.

The apparent rareity of this condition in the pig has induced Müller, of Lilienthal, to record the following case.

The subject was a young pig, which Müller saw at the age of about ten weeks, the owner having bought it along with others about a week before. Since then the pig had eaten fairly well, but coughed a great deal and was "short of breath." Now and then it vomited quite small quantities of food.

Müller found that the animal was very backward in development compared with the others of the same litter, and that it breathed short and coughed much. Fever was not present. Müller suspected swine plague, and the official veterinarian agreed. The pig was shut up on that account, but was not slaughtered.

For the next five months, despite the best feeding, the pig continued to thrive very badly. At the end of that time it was slaughtered on account of its backward development. Müller did not see it again during the period, and does not say whether the cough and other respiratory symptoms persisted. The live weight at the time of slaughter was 48 kilogrammes, while the other pigs weighed about 80 kilogrammes each.

Post-mortem, all the organs were found to be healthy. The heart and lungs were enlarged, the lungs especially so. The cervical portion of the œsophagus presented a sausage-shaped doughy swelling, fairly uniform in outline, about 3-1/5 in. long and about 4-4/5 in. in circumference. When cut into longitudinally, this swelling was found to contain fresh green food. The mucous membrane showed no pathological alterations. The entrance to the diverticulum was funnel-shaped; the exit from it formed a small opening, through which an ordinary lead pencil could only just be passed. The further course of the œsophagus showed no abnormalities.

Müller remarks that the anatomical structure of the pig renders it difficult to diagnose a diverticulum of œsophagus in this animal. In view of the symptoms that were observed, therefore, the diagnosis of swine plague is quite explicable.—(*Berliner Tier. Woch.*) W. R. C.

Annual Administration Report of the Civil Veterinary Department in Sind for the Official year 1914–15.*

Mr. J. G. Cattell held charge of the office of Superintendent, Civil Veterinary Department, Sind, Baluchistan and Rajputana, from 1st to 16th April, 1914, and from 19th October, 1914, to 31st March, 1915. He was on combined leave from the 17th April, 1914, to the 18th October, 1914. While in charge of the office Mr. Cattell spent 114 days on tour in Sind, and travelled 526 miles by road and 3298 miles by rail. Last year he was on tour for 127 days, and travelled 454 miles by road, and 3769 miles by rail. He toured under canvas in parts of the Thar and Parkar, Nawabshah, Hyderabad and Karachi districts, inspected all the veterinary dispensaries in the province, and attended the Horse Show at Jacobabad, Upper Sind Frontier District, and acted as a member of the Judging Committee at the Cattle Show held at Landhi in the Karachi District. When touring in the province the Superintendent checked the inoculation work of Veterinary Assistants when possible and attended outbreaks of epidemic disease.

Mr. E. S. Farbrother, I.C.V.D., who acted for the Superintendent during his absence on leave from April to October, 1914, remained attached to the Superintendent's office for the remainder of the year. He availed himself of one month's privilege leave from 5th November to 4th December, 1914. Mr. Farbrother was on tour in Sind for 47 days, when he travelled 206 miles by road and 3586 miles by rail. Mr. Farbrother attended the opening ceremony of the Lawrence Veterinary Dispensary at Sujawal and visited Sukkur to select a site for a new veterinary dispensary to be opened there. He attended the mule show at Larkana and the cattle show at Landhi, and inspected all the veterinary dispensaries in the province except the one at Hala. He also visited

* Concluding portion of Report of C.V.D. Bombay Presidency (pp. 401, 447 ante.)

outbreaks of disease and checked the inoculation work performed by Veterinary Assistant.

Veterinary Instruction. There were four stipendiary students studying at the Bombay Veterinary College during the year 1913–14. Two more scholars were sent during the year under report, making a total of six students studying at the College at the close of the year.

Treatment of Disease.

During the year epidemic disease was reported from each of the seven districts in the province. One hundred and seventy-two deaths were reported amongst equines, 1965 amongst bovines, and 423 amongst other animals, against 73,895 and 94 deaths respectively reported last year. This information cannot be considered as accurate, and reliance should not be attached to the mortality statistics.

Surra appeared in four districts. The mortality was 163 against 62 deaths reported last year.

Several cases of equine surra were treated at dispensaries with disappointing results.

Rinderpest. The disease broke out in the Karachi and Hyderabad districts; 273 animals were attacked, of which 200 died against 246 deaths reported last year. No inoculations were performed against rinderpest, as either the disease was reported too late or the owners refused to have their cattle inoculated.

Foot-and-mouth-disease occurred in the Karachi, Larkana, Hyderabad, and Thar and Parkar districts, and the animals attacked numbered 2002. The mortality from this disease was 46. Most of the outbreaks were attended by the veterinary staff. As the deaths from this disease are small, people pay little attention to it and the extent of the prevalence of foot-and-mouth disease in a district cannot be approximately estimated.

Haemorrhagic septicaemia appeared in all the districts except the Upper Sind Frontier District; 1467 animals were attacked, of which 1407 died, against a mortality of 341 in the previous year.

Preventive inoculation (serum alone) was carried out by the veterinary staff in 22 outbreaks in the Karachi, Hyderabad and Larkana districts. 2984 animals were inoculated, of which four died after inoculation. 422 uninoculated contact animals died of the disease. Last year 856 inoculations were performed. There is considerable opposition to preventive inoculation and it requires tact to induce owners to have their cattle inoculated. An encouraging feature during the year was that several cattle owners, who had had previous experience of inoculation, came forward voluntarily when disease appeared in their villages during the year under report, and asked that their healthy cattle might be inoculated.

Black quarter caused the death of 186 animals out of 238 animals attacked by the disease, against 46 deaths last year. One hundred animals were vaccinated (pillule) against the disease, of which three died.

Other contagious diseases. One hundred and twenty-six deaths occurred amongst bovines from other contagious diseases, the most important of which were parasitic.

Pleuro-pneumonia contagiosa caused the death of 163 goats.

Anthrax. Three deaths were reported (one equine) from the Karachi district against 20 reported last year.

Bubonic Plague. Four cases, which proved fatal, were detected in the Zoological Gardens, Karachi, against three deaths reported from the gardens last year.

Rabies. Fifty cases of rabies were reported by Veterinary Assistants during the year. Of the 50 cases 47 were reported by the Veterinary Graduate, Karachi. The disease appears to be increasing in Karachi. The Veterinary Graduate induced 25 persons who were bitten by rabid animals to go to the Pasteur Institute, Kasauli, for treatment. The Superintendent understands that several other persons were sent to Kasauli by medical practitioners.

Other contagious diseases. Two hundred deaths were reported from other contagious diseases in animals other than equines and bovines. The chief causes of mortality were fluke disease and parasitic gastro-enteritis.

Touring by Veterinary Assistants. Instructions were issued at the beginning of the year that all Veterinary Assistants should do a certain amount of touring each month as apart from visits for attendance on reported outbreaks of epidemic disease. These tours have been of considerable value in making known the work of the department in the villages and of bringing to light unreported outbreaks of disease. When all dispensaries are provided with trained Salutri-compounders the amount of touring to be done by Veterinary Assistants will be increased. Two thousand five hundred and forty-three cases were treated for contagious and non-contagious diseases and 11 castrations were performed on tour, as compared with 2,916 animals treated and 2 castrations performed last year. Veterinary Assistants visited 938 villages against 381 villages visited last year.

Veterinary Dispensaries. At the commencement of the year there were 11 dispensaries working in the province. One more was opened at Kandkot in the Upper Sind Frontier District in August 1914. Arrangements were made to open dispensaries in hired buildings at Matli in the Hyderabad District and at Nawabshah, but suitable graduates could not be obtained and the dispensaries were not opened.

The number of patients actually treated at dispensaries was 15,706 and medicines and advice were supplied to the owners of 1,839 cases which were not brought to the dispensaries, making a total of 17,545 against 16,013 in the previous year. The number of castrations performed at dispensaries was 69 as compared with 74 last year.

Buildings were completed at three stations during the year under report. Additions and alterations were carried out at three dispensaries.

Fairs and Shows. A cattle show was held at Landhi in the Karachi District in February 1915 in conjunction with the Agricultural Show. One-hundred and fifty-one animals competed for prizes. A sum of Rs. 179, two silver medals and a *lungi* were awarded from Local Funds, and two silver tumblers were presented by an Indian gentleman. This was the first show held at Landhi. The classes were well filled and on the whole the cattle, which were of the Karachi breed, were of good quality.

Establishment. At the commencement of the year there were 11 Veterinary Assistants employed. Two men were appointed during the year.

Twelve Veterinary Assistants were employed at dispensaries and one as reserve. Of the 13 Veterinary Assistants, 11 are Government servants and 2 are paid by District Local Boards.

Khan Sahib S. G. Haji held the post of Deputy Superintendent throughout the year. He was on tour in the province for 158 days as against 150 last year. He travelled 5,233 miles by rail and 1,209 miles by road as compared with 7,034 and 1,122 miles respectively travelled last year. The Deputy Superintendent visited 241 villages against 214 villages visited last year. He inspected all the veterinary dispensaries in the province twice except the one at Kandkot which was only opened in August 1914.

The Deputy Superintendent checked inoculation work and attended outbreaks of disease when possible. He made inspections of cattle and delivered lectures to stock-owners in the villages. He helped to make

arrangements for and acted as a member of the Judging Committee at the Landhi Cattle Show. He assisted the military authorities in purchasing cattle for the army, and a representative of the Japanese Government in selecting cattle for export to Japan. Mr. Haji worked satisfactorily throughout the year.

GENERAL REMARKS.

The increased allowances sanctioned for the subordinate veterinary staff in Sind, should overcome the difficulty experienced since the reorganization of the department of getting suitable men to serve in the province and of obtaining Sindhi candidates for the Bombay Veterinary College.

Under the rules introduced in 1913-14 there has been a considerable improvement in the reporting of outbreaks of epidemic disease, although it is still unsatisfactory. Many outbreaks are not reported at all. In order to deal effectively with outbreaks of disease prompt reporting is essential, and this applies specially to the disease haemorrhagic septicæmia which runs a rapid course and causes a high rate of mortality.

The Superintendent has submitted a note to the Commissioner in Sind on the advisability of doing something to conserve the Karachi breed of milch cattle. High prices are obtainable for good Karachi cattle for export to Ceylon, Zanzibar, Japan and elsewhere and cattle owners, tempted by the prices, have sold many of their best animals with the result that the herds are now showing signs of deterioration.

J. G. CATTELL, I.C.V.D.,
Supt. C.V.D., Sind, Baluchistan and Rajputana.

The Resolution signed by the Under Secretary to Government says (Sec. 4):—"As regards the Department generally Government notice with regret that progress has been handicapped both in Sind and the Presidency by recruiting difficulties, and that the staff at the end of the year was a good deal below strength." . . . . "The administration of the Department during the year has been characterized by a degree of care and efficiency which is creditable to all concerned."

On some antiseptic dressings.

The following excerpts are from notes by Major A. Don, R.A.M.C. They are given as the result of ten months experience in a casualty clearing station, and as an unbiassed comparison of the several agents used.

"Among the many methods of dressing wounds one comes across, none are really new, but one recognises many an old friend in new war paint, habilitated with elaborate word-painting more or less accurate and convincing. A dip into a good text-book of surgery in use, say, about the early part of last century will convince any sceptic, though it is a thankless task to recommend such a perusal. A good description of the treatment of foul wounds with chlorine, iodine, and saline compounds, and even of gas gangrene itself, will be found and will well repay the ardent student. The cruder drugs produced then, as now, in a short time very candidly stated, a clean surface from which exuded laudable pus—that transition in the discharge from the nauseating putrefactive débris of decaying tissues to the odourless creamy pus, then, as now, considered laudable—coming from living tissues in which are to be found the ordinary pyogenic germs alone. Putrefactive organisms can attack only dead tissues or those weakened by pyogenic processes or mechanical traumatism. To get rid of the putrefactive organisms and to prevent the ingress of the pyogenic has been the problem of wound treatment for surgeons in the present campaign. Towards this objective I offer my experiences.

Hypertonic Solutions.

Wright's saline treatment has received perhaps more praise than any other. In theory it seemed excellent, but in practice the results are various. When used properly and in suitable cases they are good, but the cases require careful selection, and its application requires more skilled watching than can usually be given. The method and choice of cases cannot be left to the discretion of a dresser or even to the average medical man attached to a casualty clearing station, and if used as a routine dressing the results are more often possitively bad than passably encouraging—often they are either too long continued for bad lacerations or are applied to many cases almost clean, where they are unsuitable.

The salt preserves the dead tissues from putrefaction (a well-known use of salt), for it is an absolute bar to the growth of putrefactive organisms; while its irritating effect on the living tissues sets up a more or less severe discharge, which helps to prevent the ingress of pyogenic germs. But such a dressing should not be covered by non-permeable tissue, which will check entirely such outward flow of serum.

Hypochlorous Acid.

Hypochlorous acid has been used in the forms eusol and eupad. The deodorizing effect is sometimes magical, especially when the dry eupad is applied to stinking, bruised, and dead tissues. But eupad so used is very caustic and very painful, and should only be applied by the surgeon himself.

Eusol solution is seldom painful, and is a good routine application, but some skins are very susceptible to it. It should always be freshly mixed, applied once or exceptionally twice daily, and should not be covered by protective. Eusol is one of the best methods we have tried, and it need not be continued after the wound is fairly clean and free from smell. A sterile dressing is then quite sufficient.

Iodine.

Iodine in spirit or watery solution acts pretty much like hydrochlorous solutions, as a deodorant, while the spirit preparations act like the hypertonic salines, by inducing a serous flow. Iodine is very irritating to most skins, and the pain continues for some time after the dressing is applied.

Spirit: Glycerine.

Methylated spirit or glycerine, alone or charged with antiseptics—for example, biniodide spirit, glycerine and ichthyol—both act like the hypertonic saline in producing free discharge, and require frequent changing. They do not cause so much pain, but are expensive to use in routine work.

Carbolic Acid.

Carbolic acid, when used pure, cauterizes the surface, and is only feebly antiseptic, as its combination with albumin dams back all discharges. It is a useless application where there is deep destruction of tissue. It runs over and destroys the skin, and cannot be recommended as a first treatment for wounds of any kind. In solutions of 1 in 60 and double cyanide gauze it is quite good in a rush. It is painless, can be applied to most wounds indiscriminately, and the dressing can be left entirely to nurses and even to orderlies in emergencies without risk. But carbolic is a weak destroyer of putrefactive organisms. The greatest danger in its application is infection of the wound from wringing the gauze with the bare hand; this can be avoided by gloves or by applying the dressing moist with sterile forceps.

Hydrogen Peroxide.

Hydrogen peroxide cleans a cavity or surface quickly, and is a good deodorant, but is not satisfactory as a wet dressing applied on gauze. The under layers become clogged and non-absorbent. It is a weak antiseptic, which at once produces its total effect if thus applied—it checks drainage of discharges and promotes absorption. Its mechanical effect is practically its only recommendation as a lotion for dressing. It is quite good as a bath for foul-smelling wounds, either alone or with boracic.

CONCLUSION.

It is not so much the antiseptic dressing used as its intelligent application that matters. Almost any one of the methods we have tried will give average good results, but there are cases in which one application is more suitable and more easily applied than any of the others, and it is here that the specialist in surgery in a casualty clearing station comes in. He should never become an enthusiast in any one method of dressing, as he is then a danger to his patients, and an embarrassment to his colleagues.

Writing on "The Prevention or Control of Infection in gunshot wounds at the earliest possible moment after their infliction," Sir Berkeley Moynihan, Lt.-Col. R.A.M.C., says :—

"Shortly after the outbreak of the war the surgeons whose duties kept them at home were amazed at the severity of the infection in the wounds of soldiers returning from France. It was felt that adequate measures were not being taken to deal with these injuries. And discussions, both public and private, were frequent and not devoid of acrimony. Sterner measures were advised, the painting of all wounds with pure carbolic acid, or with tincture of iodine, which in the few years before the war had come again into favour among surgeons for many purposes. These were tried in France very thoroughly for a certain period. A large number of wounds were treated exclusively with pure carbolic acid, a certain number with tincture of iodine, others with simple field dressings. By the time the base hospitals were reached it was not possible to say what early measures had been tried. In all wounds suppuration was rampant, and the early and thorough applications even of pure carbolic acid were found not appreciably to alter the subsequent severity of infection. Pure carbolic acid, since Lister introduced it, has been taken as the standard of germicidal power. We have thought and spoken of pure carbolic acid as something of the greatest potency, all-conquering in its fight with germs. The truth is that, speaking comparatively, pure phenol is a very feeble antiseptic ; and in contending with the organisms which had obtained a firm hold on the nutrient medium of these fresh wound surfaces it was little better than nothing. Its bactericidal power, always feeble, is much reduced when it is called upon to act in the presence of serum or pus ; and when used in full strength it is apt to damage healthy tissues.

"Hypochlorite" solution, the details of the making of which have been given by Dr. Dakin, has, on examination, proved to have a bactericidal value which is far higher than that of any antiseptic we have been accustomed to use. Pure carbolic acid, for example, will kill the *Staphylococcus aureus* in the presence of serum after acting for two hours when at a dilution of between 1 in 50 and 1 in 100. Dakin's solution acts in like circumstances at a dilution of 1 in 1500 to 1 in 2000. It possesses other qualities. It is diffusible, it does not irritate unduly, it has a remarkable power of clearing away sloughs, it is easily obtainable, and it is very cheap. It has proved, in the hands both of the French and the British surgeons who have tried it, to retard or to prevent the development of sepsis more effectively than any other preparation that has been tried.

"I have had the opportunity of trying another preparation by Dr. Dakin—"chloramine," which in some respects is better than the hypochlorite solution. Chloramine is toluene-sodium-sulphochloramide. The molecular concentration required to kill staphylococci in presence of serum is one-fifth that of the hypochlorite solution. It is very soluble and very easily diffused. After many trials, Dr. Dakin succeeded in preparing chloramine gauze—a gauze in whose meshes powdered chloramine is held. This gauze, thoroughly impregnated with this strongly antiseptic powder, was made in the hope that when introduced into the wound the discharges would dissolve the powder little by little and carry it to all parts of the surface with which they come in contact. In our work in Leeds and elsewhere in the Northern Command we have used a certain amount of this new gauze, with results that justify us in believing that it is the best method so far introduced for checking and controlling the development of infective processes. I have used it in wounds very heavily infected, and its power of cleaning a wound, abolishing the offensiveness of discharges, and bringing about a growth of new healthy granulation tissue is very remarkable. The opportunities for testing its inhibitory properties are very few in civil practice, but such little experience as I possess suggests that it may prove to be one of the most powerful of all known methods for aborting a grave infection in any of the wounds of war."—*Brit: Med: Jour:*

THE THERAPEUTIC VALUE OF HYPOCHLOROUS ACID, BY RAÚL FLORES CÓRDOVA, M.D. LIMA, from the Lister Institute of Preventive Medicine, London.

During the last nine months various investigators have dealt with the hypochlorites as antiseptics—Lorrain Smith, Murray Drennan, Rettie and Campbell, Dakin, Schütze—and also given the results of treatment by intravenous injection—Lorrain Smith, Ritchie and Rettie, and Brand and Keith, in cases of puerperal infections ; Fraser and Bates, in cases of toxaemia consequent to gas gangrene.

In this paper I publish further and more detailed experiments to determine the antitoxic and antiseptic power of hypochlorous acid *in vivo*.

It has been shown by Dakin that in *in vitro* staphylococci suspended in saline are killed within two hours by sodium hypochlorite, 1 in 500,000, but that when serum is present a concentration of 1 in 1500 is needed.

It has been thought, therefore, important to prove experimentally (1) which is the highest concentration of of HClO tolerated by animals, and (2) what is the lowest concentration producing an antiseptic or antitoxic effect.

Rabbits of about two kilos in weight, and, therefore, with approximately 90 c.cm. blood were used. The HClO solution employed was eusol with a hypochlorous acid concentration of 0.5 per cent., physiological saline being used in place of water and $CaCl_2$ added on account of its antitoxic properties ; it is prepared as follows :

To 800 c.cm. physiological saline add 10 grams bleaching power and 10 grams boric acid, shake vigorously, allow to stand for two or three hours, then filter and add to the filtrate 2 grams of chemically pure calcium chloride. The solution now contains HClO in a strength of between 0.5 and 0.6 per cent. ; saline is added until the required concentration of 0.5 per cent. is reached. Owing to its instability the solution must not be used longer than three days after preparation.

While 20 c.cm. of this HClO solution, giving a con-

centration of about 1 in 1100 in the blood of the animal, were generally well tolerated, 10 c.cm. proved to be entirely harmless, and the concentration of about 1 in 2000 that resulted appeared, moreover, to be near the limit of efficiency; 5 c.cm. doses (about 1 in 3800) seldom led to beneficial results.

Attention may be drawn to the fact that a great number of toxins of bacterial origin are considered to be of an albuminoid nature (Brieger and Fraenkel, Brieger and Boer, Etienne Burnett); it is possible, therefore, that hypochlorous acid may neutralize toxins by coagulating and eventually precipitating them.

[Tables are given showing results of injection intravenously of 10 c.cm. HClO solution on rabbits.

Diphtheria Toxin. Seven rabbits received 10 L.D. toxin subcutanously. followed in three of them immediately, and again after 24 hours by 10 c.cm. HClO sol. intravenously [remained healthy].

Two others injected after 24 hrs. and 48 hrs.; and one after 24 hrs. and 72 hrs. [paralysis of legs after five days.] Control: death in less than 48 hrs.

Tetanus toxin. Four rabbits 0.1 c.cm. toxin subcutaneously. One injected after 24 and 72 hrs. [tetanus]. Two injected after 24 and 48 hrs. [healthy]. Control—tetanus.

Four rabbits 0.25 c.cm. after 24 and 48 hrs. [healthy]. Control—dead after four days.

Six rabbits 0.50 c.c. after 24, 48, and 72 hrs. [two dead after seven days; one after eight days; one after 11 days; one healthy]. Control—dead after four days.

Staphylococcus pyogenes aureus. Four rabbits received intravenously 50 million. One injected immediately and after 24 hrs.: two immediately and after 48 hrs. [healthy]. Control dead after 48 hrs.

Six rabbits received 100 millions. Five injected immediately and after 24 hrs. [four healthy; one dead after 10 days]. Control dead after 24 hrs.

Bacillus perfringens. Three rabbits received subcutaneously 50 millions, and were injected after 24 and 48 hrs. [healthy].

Four rabbits, 100 millions. Injected after 24 and 72 hrs. [two healthy: one dead after eight days]. Control—dead after 48 hrs.

CONCLUSIONS.

It has been found that in rabbits 10 c.cm. intravenous doses of a 0.5 per cent. HClO solution, even when repeated on two or three days in succession, produce no ill effects, that they may delay or prevent the onset of symptoms due to the injection of animals with diphtheria and tetanus toxins, and with cultures of *Bacillus perfringens* and *Staphylococcus pyogenes aureus*, the rabbits recovering from the infection or remaining healthy.

Hypochlorous acid intravenously administered is therefore to be regarded as of therapeutic value; the antiseptic apparently delays the development of bacteria and destroys their toxins, thus enabling the natural resistance of the animal to assert itself.

It is suggested that this destruction of toxins may be in the nature of a protein coagulation.—*B.M.J.*

"GIVING IT AWAY."—When the Ormskirk Tribunal met, the Chairman, Mr. F. A. Jones, narrated that at one of their meetings a conscientious objector, who said he was a Christadelphian, objected to the taking of life in any form whatever. After he was refused exemption, and on being told in the waiting room that his appeal had not been granted, he exclaimed, "Every one of the —— lot of you ought to be shot."

Belfast Abattoir.

In a paper on the Belfast City Meat Supply, read before the Belfast Rotary Club, Mr. J. A. Jordan, M.R.C.V.S., said the new abattoir was the doctor's pet scheme as the first great step to the realisation of his ambition to obtain "pure meat and pure milk for the people of Belfast." The abattoir was undoubtedly an enormous improvement upon the old establishment, and though its financial working was as yet hardly as satisfactory as had been hoped, there was every prospect of substantial improvement in this respect within the next few years. Speaking of the methods of slaughtering oxen, he said that all the implements for merciful despatch of the animals had been obtained, including the humane killer advocated by the R.S.P.C.A., which he thought was the best yet devised. Many slaughtermen, however, still adhered to the pole-axe and hammer. Since the establishment of the new abattoir private slaughterhouses in the city had been closed, and last year 102,933 animals were slaughtered in the abattoir as compared with 1050 in the old abattoir the first year of its establishment in 1870.—*The Farmers' Gazette* (Dublin).

Unclean Milk.

At Bradford, on 10th inst., Lister Woodhead, farmer of 50 Smith Road, was find 20s. for failing to exercise due diligence to prevent contamination. It was alleged that, although an inspector had pointed out to the defendant that the udders of two of his cows were defective, defendant had sold milk from these cows, and the samples showed the presence of pus, an inflammatory discharge which was liable to create serious illness in persons, especially young persons taking the milk. Defendant said he had never sold any of the milk from the defective cows, and maintained that the swelling on the udders had been caused by a bruise, and not by a cold. The lump had been three times as large as it was when the inspector saw it, but he (defendant) had got it down by constant attention. He had been at his present address for eight years, and had never had a complaint made against him before.

Warble Maggots—a suggestion.

When living in Egypt I kept a few smooth-coated greyhounds, which frequently got bitten by native dogs, and the wounds, if neglected, speedily became receptacles for the eggs of the common blowfly. When these reached the maggot stage, I found a touch of bluestone (sulphate of copper) an efficacious means of dislodging them. They lay in a circle, like the spokes of a wheel, heads inwards and exposed to the air, and the slightest touch of the caustic made them come tumbling out, rolling convulsively. Should the habit of the warble maggots be similar, no doubt a like treatment would get rid of them.—W. J. GARNETT, in *Field*.

A new way with rats.

That the exhaust gases from motor-cars in closed garages are asphyxiating is unfortunately too true (says the *Autocar*), but it is stated that a farmer in America, whose chicken house was infested with these rodents, attached a hose to the exhaust-pipe of a car and inserted the nozzle under the floor of the infested building. Twenty rats tried to escape, but were killed by the dogs, and later, when the floor was taken up, no fewer than 140 rats were found dead or stupefied.

ARMY VETERINARY SERVICE

WAR OFFICE, LONDON, S.W.

Extracts from *London Gazette*,

WAR OFFICE, WHITEHALL, May 4.

REGULAR FORCES. ARMY VETERINARY CORPS.

Lieuts. to be Capts.:—T. J. Faithfull, H. C. Lowry, P. T. Lindsay, H. G. Tabuteau-Herrick, W. Halstead, P. B. Riley, R. F. Stirling, W. J. E. McKenzie, J. J. G. Keppel, A. S. Mathias, F. B. Sneyd, J. Rae, S. E. Holmes, D. R. Williamson, J. A. McMenamin, W. E. Phipps, R. Moore, F. Roche, R. S. Little, E. Sewell, G. C. Lancaster, J. G. T. Edwards, F. C. Minett, R. Daubney, M. G. O'Connell (Aug. 5); P. T. Saunders (Aug. 6); D. Marshall (Aug. 7); H. S. Cockburn (Aug. 8); E. H. Wyly (Aug. 11); L. A. Auchterlonie, C. J. C. Ryan (Aug. 18); H. J. Lowe (Aug. 19); R. Wooff (Aug. 24); H. L. Torrance (Aug. 27); J. Fox (Aug. 29); S. C. Rowbotham, D. C. Greene (Aug. 31); H. McC. Johnstone (Sept. 4); J. A. Ward (Sept. 7); S. Hunter (Sept. 8); J. J. Hegarty (Sept. 9); J. J. Dunlop (Sept. 10); W. McG. Mitchell (Sept. 11); M. F. O'Sullivan (Sept. 15); T. T. Taylor (Sept. 17); D. Blythe (Sept. 21); A. V. Nicholas, W. Kendrick (Sept. 28); W. H. Wortley (Sept. 29); G. A. Roberts (Oct. 2); R. C. G. Hancock (Oct. 9); S H. L. Woods (Oct. 10); C. Tracy (Oct 22); W. E. Footner (Dec. 2); R. J. Forrest, T. M. Mitchell (Dec. 23); P. D. Huston, C. P. Fisher (Dec. 24); G. Lloyd (Dec. 28); B. J. W. Nicholas (Dec. 29); C. R. Roche (Jan. 17); T. W. W. Wright (Feb. 1); J. O'Carroll (Feb. 9); M. Glynn, F. J. Shearman, A. Monro (March 1); E. J. Mulligan (March 9); H. B. Williams (March 26).

May 5.

To be temp. Lieuts.:—E. J. Lukey (Apl. 7); W. Sherriff (Apl. 17); J. A. Shannon (Apl. 18).

To be temp. hon. Lieuts.:—G. Hetherington, T. C. Huband, A. G. Miles, C. Young (Apl. 17).

May 6.

Temp. Lt. to be temp. Capt.:—L. D. D. Sewell (Apl. 16).

To be hon. Lieut.?—E. E. Scott (Apl. 17).

To be temp. Qmr. with hon. rank of Lieut.:—O. Preston (Apl. 28).

May 8.

Temp. Lts. to be temp. Capts.:—W. A. Potts (Apl. 14); D. Campbell (Apl. 20); C. J. S. Macara-Finnie (Apl. 25).

To be temp. Lieut.:—J. McR. Frost (Apl. 22).

May 9.

To be temp. Lieut.:—C. C. Parsons (April 25).

May 10.

Capt. (temp. Major) E. E. Parks relinquishes his temp. rank on alteration in posting (March 21).

Capt. E. E. Parks to be A.D.V.S. and granted temp. rank of Major whilst so employed (March 3).

Capt. (temp. Major) E. E. Seldon relinquishes his temp. rank on alteration in posting (March 31).

TERRITORIAL FORCE. ARMY VETERINARY CORPS.

May 5.

To be Lieut.:—S. R. L. Beaumont (May 6).

The King has conferred the following decoration:—

THE MILITARY CROSS.

Capt. William DeVine (Army Veterinary Corps.)

Donations to R.C.V.S.

The Secretary of the Royal College of Veterinary Surgeons begs to acknowledge the receipt of the following donations for 1916 to the College funds:—

P. Connolly, Lieut. A.V.C.	£1	1	0
C. Elphick, Newcastle-on-Tyne	1	1	0
G. Elphick, Lt.-Col. A.V.C.	1	1	0
H. S. Elphick, Capt. A.V.C.	1	0	0
C. H Golledge, Major A.V.C.	2	2	0
J. J. Hilliard, Capt. A.V.C.	1	1	0
G. H. Jelbart, Stow-on-Wold, Glos.	1	1	0
D. Keir, Capt. A.V.C.	1	1	0
H. Leggett, Middlesborough	1	1	0
Amount previously acknowledged	224	10	0
	£234	19	0

Personal.

ANDREWS.—On the 4th May, 1916, at Old College House, Lichfield, the wife of Major J. O. Andrews, A.V.C., of a daughter.

THE TAX ON MOTOR LICENSES.

Dear Mr. Codrington,

I raised your point to day in the House at question time. I got a flat refusal from Mr. McKenna to grant the reduction of the license to V. Surgeons as well as to doctors.

Since then I have seen the Financial Sec. to the Treasury, who has promised me that the matter shall be reconsidered.

I pointed out to him that V. Surgeons have to travel longer distances than doctors and that the war has made doctors busier and V.S. less busy in many places, and that they ought to be put on a par with them.

He was wholly sympathetic and is going to get a return from the Treasury to see how much the abatement to V.S. would cost.

I will keep my eye on the matter and do what I can, and am rather hopeful.—Yours,

A. RENDALL.

House of Commons, 12 April, 1916.

[Our correspondent hopes that other V.S. are invoking the sympathy and assistance of their respective Members of Parliament.]

THE A.V.C. IN THE MEDITERRANEAN.

Sir,—Reference: *Record* of Feb. 12th, 1916, page 364 Presidential address by Mr. J. Willett, M.R.C.V.S.:—

"I notice, and I daresay you all have, too, that not one of our men has been mentioned in despatches of the late G.O.C. Mediterranean Forces. Why this should be I don't know."

There was a hospital at Cape Helles from middle of May, 1915, until the evacuation, January, 1916.

Perhaps a question in Parliament by a M.P. might "meet the Speaker's eye," and discover why *they* did not?—Yours.

M.R.C.V.S.

ARE YOU STARRED?

What will be the position of fully qualified married veterinarians in private practice of military age under the new Military Act. Will they be exempt or not?

UNATTESTED.

A CORRECTION.

Marlborough Barracks,
Dublin, May 8th, 1916.

Dear Sir,—In your issue of April 22nd, 1916, my qualifications are incorrectly stated.

I should have been described as F.R.C.V.S., M.C.R.S.; L.R.C.P.; Capt. A.V.C.—Yours truly,

B. HARVEY MELLON.

Cruelty Cases at Tunbridge Wells—Lameness.

Before Alderman Symes and Mr. Beecroft at the Tunbridge Wells Borough Bench, Frank Davis was summoned for permitting a horse to be cruelly ill-treated by allowing it to be worked while in an unfit state in Eridge-road on 28th April.—Defendant did not admit the offence.

P.C. Davis stated that about 4.45 p.m. on Friday he saw a man named Griffiths driving a horse attached to a coal van. The animal was lame in the off-hind leg. The driver told witness he worked for Mr. Davis, of Little Common-road, Bexhill. The horse was examined by Mr. Roberts and witness took Griffiths into custody.

Mr. Charles Roberts, veterinary-surgeon, said the horse was suffering from a bad spavin. The hock was enlarged, and it was cruelty to work the animal. The horse was better after a rest, and as it was to be put under the care of a veterinary surgeon at St. Leonards witness did not think the horse need be destroyed.

Defendant said the horse was 13 years old and had never been lame until kicked on the near leg by another horse on the common.

The Chairman said he had seen the animal and it was not lame in the near leg where it was kicked.

Mr. Henry Jarvis, veterinary surgeon, of St. Leonards, called for the defence, and he could not agree with Mr. Roberts. The hock was coarse. He did not think the man, who was a "very decent chap," would be guilty of cruelty to any animal.

By the Chief Constable: He did not know that the defendant had been convicted four times for cruelty to animals in Sussex and once at Tunbridge Wells. He still thought the man was "a very decent chap," in spite of the convictions.

Mr. Roberts, re-called, said he thought it was merely a question of definition as to what was wrong with the horse. Recovery in such a case was doubtful, but the animal might be made fit again with rest and care.

The Chairman said the Bench had decided to adjourn the case for two months, during which time the horse must have care and rest. The Inspectors of the R.S.P.C.A. would see that the horse was kept under Mr. Jarvis's care.

Frank Davis was further summoned for permitting a horse to travel while in an unfit state on 29th April, and his son, George Davis, was summoned for travelling the horse.

Mr. R. Vaughan Gower appeared on behalf of the R.S.P.C.A.

Inspector Theobald stated that the animal in question was a black pony of which the younger defendant had charge in the London Road. The pony was very lame, suffering from a bad spavin. It was an old pony and had apparently been badly treated in the past.

Inspector Stenning corroborated, and Special Constable Fullagar also stated that the animal was in a very bad condition, and had undoubtedly suffered from ill-treatment and should be destroyed.

Mr. D. Reid Chalmers, a veterinary surgeon, said that he examined the pony. It was suffering from a very bad spavin. The condition was hopeless, and it ought to be destroyed.

The senior defendant said he was not the owner of the pony. The Inspectors of the R.S.P.C.A. lifted the leg right up, and when it was put down again the pony was lame.

Inspectors Theobald and Stenning were recalled and stated that the younger defendant told them the pony belonged to his father.

Mr. Chalmers also stated that he also heard the statement as to the ownership.

Davis, junr., denied these statements.

Another son gave evidence that his brother bought the pony.

Cross-examined, his brother was 16 years old, and had saved the money to buy the horse.

The Chairman said the case was a very bad one, and the father would be fined £2 and ordered to pay the veterinary surgeon's fees.—An order was made for the pony to be destroyed.

The case against the son was dismissed.

Lanoline and By-products of Wool.

The Australian Minister of Customs recently called attention to the waste of millions of pounds of lanoline from the numerous wool scouring establishments in the Commonwealth. The subject had previously been dealt with by Mr. J. Brownlee Henderson, Government Analyst of Queensland, who pointed out that lanoline existed in wool to the extent of 14 per cent. The German wholesale price for lanoline at that time—not the mixture of lanoline vaseline and water sold in collapsible tubes—was 11d. per lb., so that from this source a very large quantity of valuable material must have been thrown away in Australian wool scours.

"Personally," said Mr. Henderson, "I think there is certainly a fair margin of profit showing here. It is not at all likely that a process which is worked successfully and well known in Germany would cost a great deal more to work here, with such a store of raw material to hand."

Mr. Henderson also called attention to the presence of water-soluble potash salts in wool. From raw wool he showed that from 7 per cent. to 10 per cent. was obtainable without damaging the wool. In some continental countries it paid handsomely to extract the salts by washing the wool and evaporating the solution, but he thought that the evaporation could be much more cheaply accomplished in the dry air of Western Queensland than by artificial means in Europe.

An American view on Calf slaughter?

The following article is from *Hoard's Dairyman*. It will be noted that the writer ignores the question of the varying character of the foods fed to calves and older stock respectively.

"Veal is cheaper to produce than beef, for two principal reasons: First, larger gains are made in feeding young calves than in feeding more mature animals; second, veal is a by-product of dairying.

Experiments show that it requires one-fourth more feed to put 100 lb. fat on calves six or seven months old than on calves two months old. Feeders know that it requires more than twice as much feed to produce a pound of gain at the latter part of the feeding period as it does at the beginning. This, however, is somewhat balanced by the fact that the most valuable fat is laid on at the close of the fattening period.

The cost of gain, aside from the period of forced fattening, also increases with the age of the animal. From statistics covering 50,000 cattle of different ages, it is found that the daily gain in cattle at one-half year of age is 2.3 pounds; at 1½ years is 2.09 pounds; at 2½ years is 1.58 pounds; at 3½ years is 1.44 pounds; and at 4½ years is 1.2 pounds.

These figures show that a given amount of land and labour will produce more food in the form of veal than in the form of beef, and argues that a more economical way to increase the supply of meat is to raise as many calves as is possible and butcher them as veal rather than allow them to grow to maturity. Our pastures and fields will yield more meat by supporting a larger

number of animals and slaughtering them at an early age, than by feeding a smaller number to a more mature age.

The argument that if calves were allowed to grow to maturity instead of being butchered as veal we would have a larger supply of meat is an interesting bit of half-baked intelligence which has been preached quite extensively on account of the shortage of beef. As one writer, commenting on this intelligence, puts it, it is like saying that if builders would never stop work on any building until it is twenty or more stories high we would have a great deal more house room. The same type of ignorance is exposed in both arguments. No consideration is given to the fact that as the building is increased each succeeding storey costs more to build than the preceding, and as the calf grows, each one hundred pounds costs more than the preceding one hundred pounds.

It is true that if the calf were allowed to reach maturity it would yield more food than if butchered as veal. But since it must obtain its sustenance from the land, and since the older it grows the more food it requires to add a pound to its weight, it is plainly uneconomical to keep the calf until he reaches beefhood. The cheapest gains are made before the calf is six months old.

Electrical Destruction of Bacteria in Milk.

In the March number of the *Journal of the Board of Agriculture*, Mr. Frederick C. Lewis, F.C.S., assistant lecturer in bacteriological methods in the University of Liverpool, describes a new method for the destruction of bacteria in large volumes of milk by passing a suitable current of electricity through the milk during its passage through a tube connecting a container with a receiving vessel. The major portion of all bacteria in the milk is killed, and no chemical alteration in the milk so treated has been observed.

The results of bacteriological examination of treated and untreated milk appear to be very satisfactory. Judged from the standpoint of percentage reduction, the electrical method gave over 99.9 per cent., and from the standpoint of the presence of B. coli the results could not be improved upon.

Milk from a known tuberculous cow was passed through the electrical apparatus and a portion reserved for inoculation tests. In no case did the animals inoculated with the treated milk show any signs of tuberculosis. Some of the animals inoculated with untreated milk died from septic poisoning, the result of bacterial impurities present in the milk. No deaths occurred in the animals inoculated with the milk after it had been treated, except in one case, and that obviously due to other causes. The next point is that this is accomplished without any alteration in the chemical constituents of the milk so far as can be ascertained by authoritative chemical analyses. There is absolutely no change in the taste of the milk. Expert dairymen (English and foreign) have been unable to distinguish, as regards taste, between treated and untreated milk. The enzymes or ferments in the milk are not destroyed by the electrical treatment.

A study of the table of results will show that, although the bacteria are very greatly reduced in numbers, the milk is not sterilised in the strictest sense. Many groups of bacteria are always wholly destroyed, *e.g.*, the B. coli group, but certain other groups appear to contain a few individual members which are highly resistant to the electrical action. These few remaining organisms will, therefore, ultimately produce changes in the milk, but these changes are always much delayed. Even in the hottest weather in England the milk is perfectly fresh for three or four days after treatment. The change which ultimately takes place is a mild, pleasant, acid reaction and flavour. The putrefaction which is noticeable so often in stale "steam sterilised" milk has never been observed. This is of considerable importance, not only from an agricultural point of view, but also from the standpoint of infant feeding.

Now so-called pure-culture ferments are being extensively used in the butter and cheese making industries, and milk treated by this electrical process is a perfectly suitable medium for the action of culture ferments. This has been proved upon several occasions in the laboratory, and also in a special series of experiments made independently in an English margarine factory, where most of the trade ferments were available.

Samples of the treated milk were also submitted to a butter manufacturer, who tested their butter-forming characteristics. His report was that the milk was perfectly satisfactory, both as regards the quality and quantity of butter obtained from it.

DISEASES OF ANIMALS ACTS 1894 TO 1914, SUMMARY OF RETURNS.

Period.		Anthrax		Foot-and-Mouth Disease.		Glanders.†		Parasitic Mange. ‡		Sheep Scab.	Swine Fever.	
		Outbreaks (a)	Animals.	Outbreaks (a)	Animals.	Outbreaks (b)	Animals.	Outbreaks (b)	Animals.	(b)	Outbreaks (a)	Slaughtered. *
GT. BRITAIN. Week ended May 6		11	13					37	71	2	138	495
Corresponding week in	1915 ...	15	17			1	1	‡30	‡ 75	4	98	466
	1914 ...	19	20			1	1	34	56	1	108	1246
	1913 ...	9	13			3	4	55	109	2	78	1797
Total for 19 weeks, 1916		251	294	1	24	21	62	1271	3010	169	1784	5632
Corresponding period in	1915 ...	300	334			12	17	‡253	‡601	148	1490	6555
	1914 ...	356	380	11	74	35	81	1173	2111	140	1380	14094
	1913 ...	251	273			64	208	1350	2802	114	826	11895

‡ The Parasitic Mange Order of 1911 was suspended from 6th August, 1914, to 27th March, 1915, inclusive.

(a) Confirmed. (b) Reported by Local Authorities.

† Counties affected, animals attacked :— Excluding outbreaks in army horses.

Board of Agriculture and Fisheries, May 9, 1916.